DUO™ Users Manuual

Introduction

Congratulations on your purchase of the Duo, designed and manufactured by M-Audio. The Duo is a complete USB audio solution for your PC or Macintosh computer. With two inputs and two outputs of 24-bit audio and up to 96kHz sampling frequencies, coupled with two high quality mic preamps, the Duo utilizes the power and convenience of USB audio in a convenient half-rack size unit.

The Duo lets you operate its analog inputs and outputs at either +4 or -10 line levels, gives you a S/PDIF output, plus a headphone output for personal monitoring. Additionally, the Duo has a "Standalone" mode that lets you operate it as a mic preamp or A/D converter independent of your computer.

Please take the time to read this manual. It contains important information that will help you get the most out of your Duo.

What's in the Box?

Your Duo box contains:

- This Manual.
- The Duo.
- One (1) Standard USB cable.
- 9V AC 1 Amp "Wall Wart" power supply.

Quick Start Guide

The USB Audio Duo is a powerful little device that you will find easy to use once you familiarize yourself with its many features. The many aspects of the Duo are detailed in this manual, and for that reason we suggest giving it a good read through.

Here is a basic outline of the steps you will need to take to get your Duo up and running:

1. Install the drivers, following the instructions for your particular platform and operating system (see "Hardware and Software Installation" sections).
2. Hook up your microphone and/or other audio gear to the Duo inputs, and connect the output(s) to your sound system, mix deck, or headphones (see section, "Hooking Up Your USB Audio Duo").
3. Configure your music software to utilize the Duo as its audio interface.
4. Make music.

Whether your music program uses ASIO drivers, EASI drivers, Windows MME or Macintosh Sound Manager, will determine how you configure the Duo in your music program. There are entire sections devoted to using your Duo either on the PC or on the Mac.

Other aspects of the Duo, including use of the +4/-10 line level switches, phantom power, etc., are also covered in depth. Also, be sure and check out the section, "Optimizing Your Sytem for USB Audio," later in the manual. So, please read on, and enjoy your Duo.

Duo Features

- 2 critically acclaimed DMP2 mic preamps with individual gain controls.
- Balanced/unbalanced line outputs on 1/4" TRS, unbalanced line inputs on 1/4" TS.
- Preamps have maximum gain of 60dB with signal and clip indicator LEDs per channel.
- S/PDIF digital output on gold-plated RCA jack.
- Headphone output with level control.
- 48V global phantom power with switch and indicator LED.
- 20dB pad available for each microphone input.
- Multitrack recording and mixing using the convenience of your USB port.
- PC drivers include Windows XP, 2000, ME and 98SE, ASIO, EASI and WDM.
- Mac drivers include OS 9.1 and higher, Sound Manager, and ASIO.

Performance Specs:

- Dynamic Range (Direct Line In to Line Out): 105dB
- THD+N (Direct Line In to Line Out): <0.002%
- Dynamic Range (Mic In to Line Out): 107dB
- THD+N (Mic In to Line Out): <0.002%

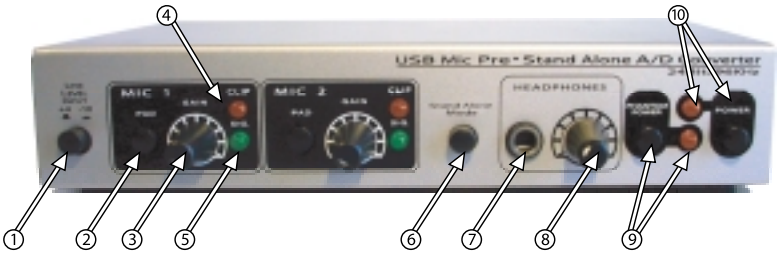
Minimum System Requirements

Macintosh

- USB (native) equipped Mac G3.
- Mac OS 9.1 minimum.
- 64M available RAM for 44.1 or 48k operation, 128 recommended. 128M available RAM for 96k operation, 256M recommended.

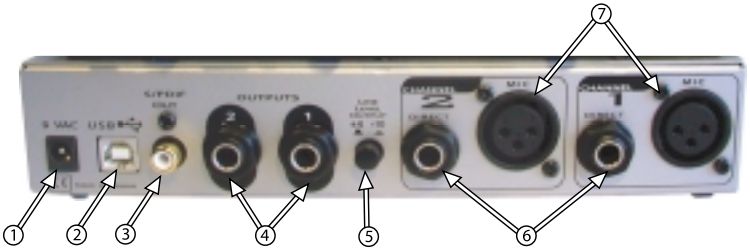
Windows

- USB equipped Pentium.
- Windows 98SE or higher.
- 64M available RAM for 44.1k or 48k operation, 128 recommended. Pentium 266 MHz MMX.
- 128M available RAM for 96k operation, 256M recommended. Pentium II, 333 MHz.



Front Panel:

1. Line Level Input Switch: This switch will set the input line level for the Duo. With the switch in the out position, the Duo will operate at a +4dBu line level. Pressing and locking this switch to the in position will set the operating line level to -10dBV.
2. Pad Switch: One pad switch has been provided for each mic input on the Duo. Pressing in and engaging the Pad switch will apply a 20dB pad, or "cut," to the microphone input prior to the microphone preamp.
3. Gain: This potentiometer controls the amount of gain applied to the microphone preamp. One Gain pot is provided for each mic input.
4. Clip LED: This LED responds to the signal present at the Duo's respective Mic input, and will begin to light when the signal reaches clipping.
5. Sig. (Signal) LED: This LED responds to the signal present at the Duo's respective Mic input, and will begin to light when a nominal signal is present at the input.
6. Standalone: Pressing in and engaging the Standalone switch will connect the Mic and Line inputs directly to the analog Line Outs, S/PDIF output, and the Headphone output. Standalone mode allows for use of the Duo as a mic preamp and/or analog to digital converter independent of the computer. This feature of the Duo also allows you to directly monitor the inputs when connected to a computer.
7. Headphone Out Jack: This output jack is designed to connect to a 1/4" TRS plug, typically for use with a set of stereo headphones. The source for the signal at the Headphone Out is identical to the Line Outs.
8. Headphone Level: This knob controls the amount of monitoring level sent to the Duo's Headphone Out jack.
9. Phantom Power Switch & corresponding LED: Pressing in and engaging the Phantom Power switch will send 48V of phantom power to the Duo's Mic inputs. When phantom power is switched on, the corresponding Phantom Power LED will light and remain lit.
10. Power Switch & corresponding LED: Pressing in and engaging the Power switch will power up the Duo, provided that the proper power supply is connected to the 9V AC Power jack. When power is switched on, the corresponding Power LED will light and remain lit.



Back Panel:

1. 9V AC Power Jack: This power jack accepts a 9v AC 1 Amp 2.5mm power supply. This power supply is included with your Duo, and ONLY the proper supply should be used.
2. USB Connector: This jack accepts the device-end of a standard USB cable.
3. S/PDIF Out: This coaxial RCA digital audio output connector receives audio from one of two sources. With the "Standalone" switch in the Out position, the S/PDIF Out receives audio from the computer's software outputs. With the "Standalone" switch in the In position, S/PDIF Out receives audio from the Mic or Line inputs of the Duo.
4. Line Outputs: These 1/4" TRS jacks, labeled "Outputs," are the main outputs for the Duo. Using a TRS (tip-ring-sleeve) 1/4" plug, the Duo will provide a balanced line-level output. Using a TS (tip-sleeve) 1/4" plug, the outputs will be unbalanced. The Line Outs receive audio from one of two sources. With the "Standalone" switch in the Out position, the Line Outs receive audio from the computer's software outputs. With the "Standalone" switch in the In position, the Line Outs receive audio from the Mic or Line inputs of the Duo.
5. Line Level Output Switch: This switch sets the operating line level for the Duo Line Outs. In the 'out' position, the Duo Outputs 1 & 2 are set to +4dBu line level operation. Pressing and locking this switch to the in position sets these outputs to a -10dBV line level.
6. Line Inputs: These 1/4" jacks accept TS 1/4" plugs. These are line level inputs, and generally will be connected to the outputs of a line level instrument or preamp.
7. Mic Inputs: These are the balanced, low impedance microphone inputs to the pre-amp channels. NOTE: When phantom power is engaged, power is sent to BOTH of these channels. An XLR jack is disabled when an instrument is plugged into the corresponding 1/4" jack.

Bottom of Unit:

At the bottom of the unit are two DIP switches that will set the sampling rate while the Duo is used in standalone mode. The Duo can be used as an A/D converter independent of the computer, using either the line inputs or the mic preamp inputs. The relative positions of these DIP switches will determine the sample rate at the S/PDIF output when used in standalone mode.

You will see the rather tiny numbers 1 and 2 at the bottom of the set of two DIP switches. Using a miniature screwdriver or similar instrument, you can change the position of each switch. The default setting is both switches "down," which is the position closest to the numbers 1 and 2, representing a sample rate of 44.1kHz. The full list of settings is as follows:

1. 44.1kHz: Both switches in the down position (down being in the direction of the numbers).
2. 48kHz: Switch #1 down, switch #2 up.
3. 88kHz: Switch #1 up, switch #2 down.
4. 96kHz: Both switches in the up position.

Basic Theory of Operation

The Duo attaches easily to your computer's USB port--no tools or computer disassembly is necessary. Following the installation of the included driver software, the Duo can be attached or unattached to your computer according to your needs.

The Duo is a 2x2 audio interface, providing two channels of audio *TO* the computer and two channels of audio *FROM* the computer. The Duo gives you two high quality, low impedance Mic Inputs on XLR connectors, plus two unbalanced Line Inputs on 1/4" TS jacks that can be used alternately. When a Line Input is in use, the corresponding Mic Input is disabled.

The Duo can be configured for +4 or -10 line level operation simply by pressing the "Line Level" buttons on the front and/or back panels. This allows for seamless integration into the studio, giving you compatibility with professional balanced (balanced TRS, +4dBu) or semi-pro (unbalanced TS, -10dBV) audio devices (see section, "Using the Input and Output Level Switches").

Audio from your computer is sent simultaneously to the Duo's two balanced/unbalanced Line Outputs on 1/4" TRS jacks, the coaxial S/PDIF Output, and the Headphone Out. The Duo can also be used in a Standalone mode, which connects the Mic/Line inputs directly to the Line Out, S/PDIF Out, and Headphone Out. Pressing the "Standalone" switch turns the Duo into a mic preamp and A/D converter that can be used independent of the computer. Standalone mode can also give you a direct monitoring option when using the Duo as an audio interface with your computer.

The Duo can be used with the Sound Manager on the Macintosh, or with the Windows Sound System in Windows, and therefore can operate as your system sound card. If your software is ASIO or EASI compliant, such as Steinberg's *Cubase* or Emagic's *Logic*, we suggest using the ASIO or EASI drivers. These drivers will allow you to monitor audio through your music program with greatly reduced latency. The WDM drivers that are used in Windows ME, 2000, and XP will give you similar monitoring capability when using a music program that takes advantage of them, such as Cakewalks's *Sonar*.

Hardware & Software Installation on the PC

Here is a simple, step-by-step procedure for attaching and powering up the Duo. See the section, "ASIO/EASI Operation" for information on configuring ASIO or EASI drivers.

1. Plug the Duo wall-wart into your wall receptacle and to the Duo 9vAC power jack. Use only the included power supply, or a similar power supply with the exact same specifications.
2. Connect the USB cable to your computer and the Duo (one end of the cable is for the computer, and the other is the device end). Find an appropriate spot on your desktop or work area for the Duo.

Windows XP Installation

1. Boot Windows XP with your M-Audio USB Duo powered OFF. After Windows XP has been booted, power up the Duo.
2. Windows XP will then detect and automatically install the drivers for the USB Composite Device and USB Audio Devices.
3. Insert the included Driver CD into your computer's CD drive. Assuming that your CD drive is the "D" drive, locate the Duo driver at D:\USB_AUDIO\DUO\WINXP.
4. Run the program "Duo XP PostInstaller" program by double clicking on it. This will install the Duo's Windows MME drivers, plus the ASIO and EASI drivers.
   Windows will show the "Digital Signature Not Found" Dialog. Press "Continue Anyway."
5. Restart the computer after the installation is finished.

Windows 2000 Installation

1. Boot Windows 2000 with your M-Audio USB Duo powered OFF.
2. Insert the included Driver CD into your computer's CD drive. Assuming that your CD drive is the "D" drive, locate the Duo driver at D:\USB_AUDIO\DUO\WIN2000.
3. Run the "Duo W2k Installer" program by double clicking on it.
4. Windows will show the "Digital Signature Not Found" Dialog. Press "Yes."
5. Connect and power ON your M Audio USB Duo.

6. You will then see Windows 2000 detect and automatically install the driver for the USB Composite Device.
7. Windows will detect and automatically install a number of drivers. As it does this, it will show the "Digital Signature Not Found" Dialog a few times. Press "Yes" for each dialog.
8. Restart the computer after the installation is finished.

Windows ME Installation

1. Boot Windows ME with your M-Audio USB Duo powered OFF. After Windows ME has been booted, power up the Duo.
2. Windows will proceed with the installation of the "USB Composite Device" driver. Note: If the "USB Composite Device" has already been installed then Windows will skip this step. This will occur if another USB audio device had been installed on your system at any time.
3. Windows will report that “USB Duo New Hardware” was found. When the Add New Hardware Wizard reports that it wants to search for a driver for a USB Composite Device, click "Next".
4. On the next screen, select the "Specify the location of the driver" item, and then click "Next".
5. Windows will ask you where you want it to search for the drivers. Remove the check marks from all of the optional search locations except "Specify a location." Insert the included Driver CD, click “Browse,” then, on your computer’s CD drive, locate the folder “USB_AUDIO\DUO\WINME.” Click "Next".
6. On the next screen, Windows will indicate it has found an updated driver for this device. Keep the updated driver selected and click "Next".
7. Windows will report that is it ready to install the driver. Click "Next" to continue.
8. Windows will process the files and then indicate it has finished installing the software that your new hardware device requires. Click the "Finish" button. You will need to repeat these steps as many times as Windows finds a new hardware device. By the time everything is finished you will have installed the Duo’s Windows MME drivers, plus the ASIO and EASI drivers.
9. Windows might indicate it cannot find a file it is attempting to copy from the Windows ME CD. If so, insert your Windows ME CD, then use the Browse button to point to this CD and continue.
10. Windows will process the files and then indicate it has finished installing the software that your new hardware device requires. Click the "Finish" button.

    Note: At this point you might need to wait for several minutes while Windows configures the hardware. Please be patient.

11. Restart the computer after the installation is finished.

Windows 98 Second Edition Installation

1. Boot Windows 98 SE with your M-Audio USB Duo powered OFF. After Windows 98 SE has been booted, power up the Duo.
2. Windows will proceed with the installation of the "USB Composite Device"

driver. Note: If the "USB Composite Device" has already been installed then Windows will skip this step. This will occur if a USB audio device had previously been installed in your system.

3. Windows will report that “USB Duo New Hardware” was found. When the Add New Hardware Wizard reports that it wants to search for a driver for a USB Composite Device, click "Next".
4. On the next screen select the "Search for the best driver for your device." item, and then click "Next".
5. On the next screen, remove the check marks from all of the optional search locations except "Specify a location." Insert the included Driver CD, click “Browse,” then, on your computer’s CD drive, locate the folder “USB_AUDIO\DUO\WIN98SE.” Click "Next".
6. On the next screen, Windows will indicate it has found an updated driver for this device. Keep the updated driver selected and click "Next".
7. Windows will report that is it ready to install the driver. Click "Next" to continue.
8. Windows will process the files and then indicate it has finished installing the software that your new hardware device requires. Click the "Finish" button. You will need to repeat this step as many times as Windows finds a new hardware device. By the time everything is finished you will have installed the Duo’s Windows MME drivers, plus the ASIO and EASI drivers.
9. Windows might indicate it cannot find a file it is attempting to copy from the Windows 98 CD. If so, insert your Windows 98 Second Edition CD, then use the Browse button to point to this CD and continue.
10. Windows will process the files and then indicate it has finished installing the software that your new hardware device requires. Click the "Finish" button.

    Note: At this point you might need to wait for several minutes while Windows configures the hardware. Please be patient.

11. Restart the computer after the installation is finished.

Hardware & Software Installation on the Mac

Here is a simple, step-by-step procedure for attaching and powering up the Duo on the Macintosh Computer. The Duo comes with an installer program that will place all driver components in their proper folders.

The installer program will give you a list of ASIO compliant programs that it will recognize and subsequently install the appropriate ASIO driver if the program exists on your system (that being said, it is a good idea to first install your music program before installing the Duo drivers, though Duo drivers can be installed again if necessary). Otherwise, the Duo ASIO drivers (and the remaining ASIO drivers that have not been used) will be placed in a folder on your desktop called “Duo ASIO,” and must be inserted into your music program’s ASIO folder manually, provided that your music program uses ASIO.

1. On the Driver Disk that came with your Duo, locate the folder “USB_Audio_Duo” that contains the USB Duo Installer for the Macintosh.

Double click on the Installer program. The Installer program installs all Duo extensions, and installs the ASIO driver in a folder named "Duo ASIO"on your desktop.

2. locate the program's ASIO folder (it will be found within the program's folder on your Macintosh HD). Drag the ASIO driver (located in the "DUO ASIO" folder created by the Installer) to that folder.
3. Properly shut down the computer.
4. Plug the Duo wall-wart into your wall receptacle and to the Duo 9vAC power jack.
5. Connect the USB cable to your computer and the Duo. Power up the Duo, then power up the computer.

For information on how to enable the Sound Manager to use the Duo, see the section "The Duo and the Macintosh Sound Manager." For further information on using and configuring ASIO drivers, see the section "ASIO Operation on the Macintosh."

Hooking up your USB Audio Duo

The Duo provides two line inputs and two line outputs. The Duo also provides a S/PDIF digital output on a coaxial RCA connector, plus a Headphone Out on a 1/4" stereo TRS jack for monitoring with headphones.

Each 1/4" TRS Line Out jack will accept a +4dB balanced signal on 1/4" TRS plugs (tip-ring-sleeve), or a -10dB unbalanced signal on 1/4" TS plugs (tip-sleeve). Each of the Duo's 1/4" TS "Direct In" jacks are unbalanced, and will accept an unbalanced +4dBu or -10dBV signal on 1/4" TS plugs.

The Duo provides two microphone inputs on balanced XLR connectors. Either a mic or a line input can be used on any one of the Duo's input channels. When a line input is in use, the corresponding mic input is disabled.

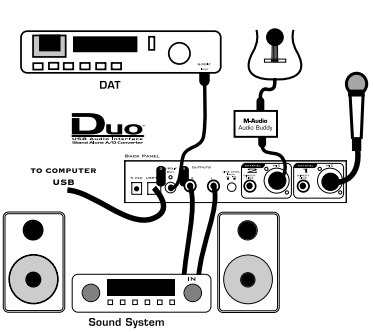
You may connect the output of a line level instrument such as an electronic keyboard, instrument preamp, or the output of a CD player or similar line-level device to the Duo's Line Inputs, Channel 1 and Channel 2. Check your device's documentation for information on its operating line level (+4dBu balanced or -10dBV unbalanced), and see the section, "Using the Input and Output Level Switches" in this manual for more information.

The Duo's Mic Inputs, Channel 1 and Channel 2, accept balanced, low impedance microphones. If your microphone is a condenser type that requires phantom power, you may apply phantom power by engaging the phantom power switch (see section, "Phantom Power"). An impedance transformer, such as an active (i.e., powered) direct box or passive transformer with 1/4" female TS to male XLR jacks can be used to connect electric or acoustic guitars or a high impedance mic to the Duo's microphone inputs.

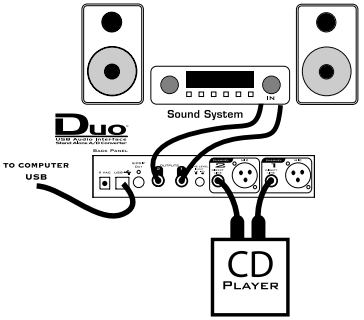
You may connect the Duo's two line level outputs to the stereo inputs of a monitoring system (power amp and speakers, or a home stereo), powered

speakers, or a headphone amplifier, or to the inputs of a mixing console. Again, check your device's documentation for information on its operating line level, and see the section, "Using the Input and Output Level Switches." The Duo's S/PDIF Out can be connected to any S/PDIF capable device, such as a DAT or MiniDisc with coaxial S/PDIF inputs.

The diagrams below illustrate two scenarios, intended as examples of how the Duo might be used. Typical Setup #1 shows the Duo with a microphone plugged into the Mic input on Channel 1, and an electric guitar with direct box plugged into the Mic input on Channel 2. The main outputs (Line Out) of the Duo are plugged into a monitoring system, with the S/PDIF Out connected to the S/PDIF input of a DAT recorder (as you would if you were mixing down). Typical Setup #2 shows a CD player plugged into the Line Input on Channels 1&2, with Outputs 1/2 plugged into a monitoring system.



TYPICAL SETUP 1



TYPICAL SETUP 2

Using the Input and Output Level Switches

Using the front panel Input Level and/or the back panel Output Level switches, you may change the operating line level for each of the Duo's stereo pair Line Level Inputs or Outputs. In the "out" position, the Duo is set to a +4dBu line level. Pressing the input level switch and locking it to the "in" position changes the operating line level to a -10dBV setting.

You can, in fact, have the input set to one line level and the output set to another, depending on your needs. This will depend on the operating line level of the device that is attached to that particular input or output. Your goal is to match the Duo's input or output line level to the line level of your source or target device.

Generally speaking, a device that runs at a -10dB line level will have outputs or inputs that are single conductor with a ground, such as RCA jacks, or 1/4" tip-sleeve phone jacks. Devices that run at a +4dB line level will have outputs or inputs that are two conductor with a ground, such as XLR or 1/4" tip-ring-sleeve

jacks. Check your source or target device's documentation for more information on its operating line level.

Using the Mic Inputs

The Duo gives you two completely independent channels of high gain, ultra low noise pre-amps. Each channel provides low impedance microphone inputs on XLR connectors with optional phantom power. Dynamic, condenser, or any type of low impedance microphone will interface easily with the Duo's Mic Inputs.

You may also attach a direct box or passive transformer to the Duo's Mic Inputs, which will then allow you to plug an electric or acoustic guitar or other high impedance instrument into the Duo's Mic Inputs. This is also described in the previous section, "Hooking Up Your Duo." Additional information on using the Mic Inputs will be found in the next three sections.

Setting the Gain

The Duo provides up to 60dB of gain on the XLR "Mic" inputs. Microphones typically emit a low signal level, requiring a "pre-amp" such as the Duo provides. Other instruments, such as guitar pickups and keyboard sound modules, may also benefit from a little bit of punch from the Duo, when used in conjunction with a direct box or passive impedance transformer.

Plug in your mic or instrument with the gain controls turned down, then turn the gain up incrementally while testing the mic or playing the instrument. When the signal LED shows fairly consistent activity, you've reached a good signal level for the Duo mic preamp. Some users may wish to experiment a little further to find what audibly might be referred to as a "sweet spot." Note that when the "clip" LED lights, it is indicating that the signal is clipping. Let your ears be the judge, but when the clip LED lights and stays lit, you are approaching or have reached distortion in your Duo signal.

You must also consider the level that is being sent from the Duo to your recording software. Check the input meters within your software and make sure that they are neither too low nor clipping (too 'hot'). An adjustment in gain on the Duo may be necessary, but your optimal recording level within your software should be approaching but never reaching the maximum level.

You will find more information on setting record levels in the manual of your music software. Understand that in digital recording, clipping is never a good thing. If your level goes into the red once, you've got distortion!

Phantom Power

Unlike dynamic microphones, many "condenser microphones" need to receive a DC voltage (generally 48v) from an external source before they can generate an output signal. If the condenser mic doesn't come with its own power supply, then phantom power must be applied from the pre-amp. Pressing the "Phantom Power" button and engaging phantom power on the Duo will send the necessary voltage to BOTH of the XLR Mic Inputs.

Phantom power will not affect a dynamic mic adversely, so its okay to have a dynamic mic at the XLR input while phantom power is switched on. Just to be safe, check you mic's documentation to see if it will accept or needs phantom power. Some ribbon mics definitely should NOT receive phantom power, as this could damage them.

Using the Pad Switch

On the front panel of the Duo, a "Pad" Switch is provided to attenuate a signal that is too hot before it gets to the mic preamp. If you find that your signal tends to clip even when the gain control knobs are set extremely low, try engaging the Pad Switch.

When pressed and locked to the *in* position, the corresponding signal will be trimmed by 20dB. Gain reduction is bypassed when this switch is in the out position.

Standalone Mode

The Duo can also be used in a "Standalone" mode, independent of your computer. Pressing the "Standalone" switch on the front panel and locking it to the in position will connect the input channels, Channel 1 and Channel 2, directly to the Line Out, S/PDIF Out, and Headphone Out of the Duo.

Operating the Duo in Standalone mode will give you three options:

1. The Duo can be used as an analog to digital, or "A/D" converter. A signal present at either the Mic Inputs or the Line Inputs will be converted to a digital audio signal and sent to the S/PDIF Out on the Duo. This will allow the Duo to be used with another digital audio device that accepts a S/PDIF signal, and not as a digital audio interface in conjunction with your computer.
2. The Duo can be used as a microphone preamp, again, independent of your computer. A signal at the Mic Inputs of the Duo will appear at the Line Outs, allowing you to use the Duo's mic preamp in a sound reinforcement situation or similar instance where its use as a computer interface is not necessary.
3. A "direct monitoring" capability can be achieved when Standalone mode is engaged while the Duo is in use as a digital audio interface in conjunction with your computer. This will give you zero latency monitoring of the signals present

at either the Mic Inputs or the Line Inputs of the Duo. You will, however, not be able to hear the software outputs from your computer in this case, so this option may only be useful to you when laying down your first recorded tracks, i.e., when there is no other audio playing back from your computer.

In cases #1 and #2, the sampling rate for the Duo's A/D converter will be determined by the DIP switch settings on the bottom of the unit. See the section, "Bottom of the Unit" earlier in this manual. It will give you more information on how to set the DIP switches for the sampling rate of your choice. The bottom of the Duo has a silk-screened guide that reveals the DIP switch settings.

In case #3, the sampling rate for the Duo's A/D converter is controlled by your music program or operating system. This is true whenever the Duo is attached to the USB port, and both the Duo and the computer are powered on.

Duo Operation on the PC

The USB Audio Configuration Manager

When the Duo drivers are installed, a control panel is also installed into the System Tray on your Windows taskbar. This control panel is the "USB Audio Configuration Manager." The configuration manager allows you to choose between the Duo's ASIO or EASI drivers and the Windows "MME" drivers, which are WDM compatible with Windows 98SE or higher. To open the USB Audio Configuration Manager, locate the M-Audio icon on the right side of your taskbar, then double click the M-Audio icon.

MME drivers allow a device to be used in Windows, as well as music applications that utilize these Windows drivers, and will appear as "USB Audio Device" both in Windows and in your music program. ASIO is a driver model developed by Steinberg, and is used by music programs that have adopted the ASIO driver standard. EASI is a driver model developed by Emagic, and is used by programs that have adopted the EASI standard. Check your music application's documentation to help determine which driver model it will use.

The USB Audio Configuration Manager, when it is first installed, defaults to the "ASIO/EASI" setting. If you are using an ASIO compliant program such as Steinberg's Cubase or Nuendo, or a program that uses "EASI" drivers such as Emagic's Logic, then you should leave the configuration manager set to "ASIO/EASI." The Duo provides its own ASIO and EASI drivers, and the music program you use should be set up to utilize the Duo's ASIO driver (see the section, "ASIO/EASI Operation").

If, on the other hand, you are using a music program that works with MME, such as Cakewalk Pro Audio or Sonar, then you will want to set the configuration manager to operate under MME. See the section, "The Duo, MME, and Your Music Program.

Additionally, the Duo's ASIO/EASI control panel can be launched from the USB Audio Configuration Manager. This is very useful in certain circumstances, and is covered in greater depth in the section, "ASIO/EASI Control Panel and Operating Modes on the PC."

NOTE: To check on the status of the USB Audio Configuration Manager, you may "mouse over" the M-Audio icon in your Windows System Tray. This will give you a read-out of the current status--either ASIO/EASI or MME.

The Duo and the Windows Sound System

The Duo's Windows Multimedia drivers will allow you to use the Duo as your Windows system sound device. In this instance, the Duo will operate at 44.1kHz sampling rate or lower, and at either a 16-bit or 24-bit setting. To set up the Windows Sound System to utilize the Duo:

1. Open the USB Audio Configuration Manager by double clicking the M-Audio logo on the right side of your Windows taskbar.
2. Select "MME," and click "OK".

3. Power down the Duo, then power it back up. This will reinitialize the Duo.
4. Go to Start | Settings | Control Panel | Multimedia, and set the playback (and record) device to "USB Audio Device." Click Apply, then click "OK" to close.

There's no need to change the setting for your Windows Sound System M-Audio device, should you choose to use the ASIO or EASI drivers in a music application, even though you will be using the USB Audio Configuration Manager in the "ASIO/EASI" setting. However, you will no longer be able to hear the system sounds through the Duo since the Windows MME driver is deactivated (see previous section).

If primarily using the ASIO or EASI drivers, you may want to set the Windows Sound System to your internal soundcard or some other audio device that already exists in your system. You will need to monitor that soundcard or audio device separately from the Duo. If your computer does not contain an audio device other than the Duo, you may simply leave the multimedia audio setting to "USB Audio Device."

The Duo, MME, and Your Music Program

Some Windows-based music programs utilize only the Windows MME (multi-media extensions) drivers, and are not ASIO or EASI compliant. The Duo's MME drivers use the "WDM" model, which make them compatible with the latest software technology.

A music program such as Cakewalk's Sonar takes full advantage of the WDM driver model, and can achieve extremely low latency when using their "Input Monitoring" feature. Sonar's Input Monitoring will allow you to monitor your signal at the software inputs, allowing you to add software effects while monitoring. Check your Sonar manual for more information.

To operate your Duo using the MME drivers and a music program, follow the instructions in the previous section, then enable the "USB Audio Device" as your input and output devices within your music program's audio setup page, and/or run your program's audio device profiling utility to analyze the new audio device in your system. At the time of this writing, it is important to follow these steps when using Sonar:

1. In the Audio | Options menu, under the "Advanced" tab, make sure that the checkbox, "Always Use MME Interface, Even When WDM Drivers Are Available," is UNCHECKED.
2. In the Audio | Options menu, under the "Driver Profiles" tab, make sure that "Stream > 16 bit data as:" is set to 3 bytes.

ASIO/EASI Operation

If your music program is ASIO or EASI compliant, you will want to use these drivers with your Duo. The ASIO and EASI drivers for the USB Duo install

automatically during the normal installation procedure. The USB Audio Configuration Manager defaults to ASIO/EASI operation, so there's no need to change any settings there.

NOTE: You may have the Windows sound system set to "USB Audio Device" while the USB Audio Configuration Manager is set to "ASIO/EASI" for ASIO or EASI operation. However, the Windows MME drivers are inactive in this instance, so no Windows sounds will be heard.

Once the drivers are installed, you may open your music program and go to the audio setup page. The "M-Audio USB ASIO" or the "M-Audio USB EASI" driver will show up in the program's ASIO or EASI Driver list (respectively), allowing you to select it at this time if it is not already selected by default. Once this selection is made, your music program will have USB Duo Input 1 and USB Duo Input 2, as well as USB Duo Output 1+2 available for selection, though this may depend on your configuration in the M-Audio USB ASIO/EASI Driver control panel (see the next section).

If you are using an ASIO or EASI compliant music program, we suggest that you enable and use the Duo's ASIO or EASI drivers. These drivers give you the advantage of being able to monitor your source through the program, often called "tape-type monitoring" and similar to monitoring the record inputs of a tape machine. Note that in Windows XP, 2000, and ME, the WDM drivers will also install automatically and can achieve the same results (with a program that utilizes them, such as Sonar from Cakewalk), yet do not need any special configuration or attention.

ASIO/EASI Control Panel and Operating Modes on the PC

Once the M-Audio USB ASIO or EASI driver is selected in your music program's audio setup page, you may launch the Duo's "M-Audio USB ASIO (or EASI) Driver" control panel. Within the program's audio setup page you will find a button that allows you to launch the ASIO or EASI device's control panel, which in this case will be the Duo. Clicking this button will launch the "M-Audio USB ASIO (or EASI) Driver" control panel, and allow you to access the Duo settings.

Normally, you will want to launch the M-Audio USB ASIO Driver panel from within your music program. You can, however, also launch this control panel from the USB Audio Configuration Manager, which is useful in special circumstances. For instance, if you have been using the Duo with only one port enabled (such as in 96k operation), some programs will not launch without having both an input and output port enabled. In this case, you will want to launch the M-Audio USB ASIO Driver panel from the Duo's USB Audio Configuration Manager and enable both the input and output ports before attempting to launch your music program.

To launch the ASIO or EASI control panel from the USB Configuration Manager:

1. Double click the M-Audio logo in your Windows System Tray, located on the right side of your Windows Taskbar. (You can also right-click the icon, then choose "Open M-Audio USB ASIO/EASI Control Panel.")
2. Click the button, "Open ASIO/EASI Control Panel."
2. In the column labeled "Interface," choose which driver panel you wish to launch--either ASIO or EASI.
3. In the column labeled "Device," choose which M-Audio USB Audio product you are using--in this case, it's the Duo.
4. Click "OK."

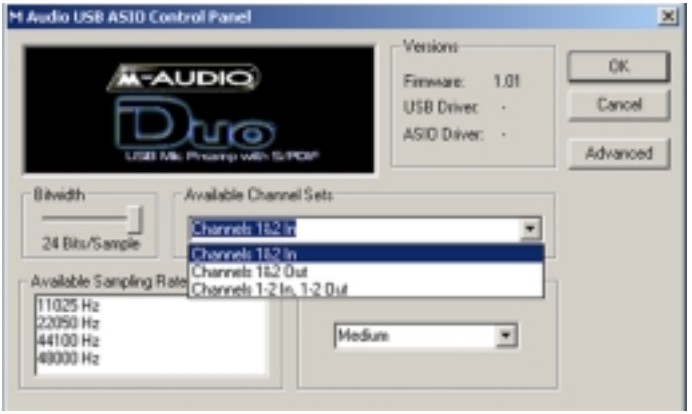
The M-Audio USB ASIO (or EASI) Driver page shows you the M-Audio and the Duo logo. In the upper right-hand corner you will see the "Versions" section, with a readout of the Firmware version, the USB driver and the ASIO or EASI driver versions currently in use by the USB Audio Duo.

Below is a screenshot of the M-Audio USB ASIO Driver panel with both pairs of input and output channels activated. There are two sections, one labeled "Available Channel Sets" and the other labeled "Bitwidth." Settings in these two sections interact with each other. At the 16-Bit setting, you will notice that the "Channels 1-2 In, 1-2 Out" option is available, and the maximum sample rate shown is 48000 Hz.

With both stereo pairs enabled, i.e., Channels 1-2 In and Channels 1-2 Out, the Duo behaves as a "2x2" audio device at 16-bits, and at sample rates of 48000Hz and below (that is, 48kHz, 44.1kHz, 22.05 and 11.025kHz). These sampling rate options as well as the bit depth setting will then be available and selectable from within your music program.

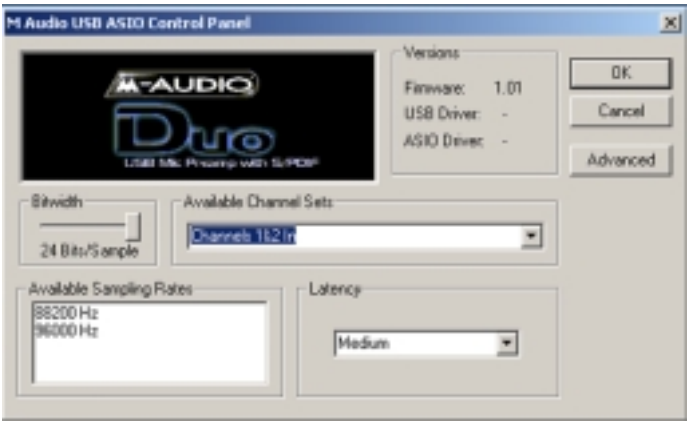
Clicking on the Bitwidth slider and moving it to the "24-Bits/Sample" setting will cause the "Available Channel Sets" list to drop down, forcing you to make

a selection. At the 24-Bit/Sample setting, both stereo input and output pairs are also available. The maximum sample rate will still be 48000 Hz.



With both stereo pairs enabled at a Bitwidth setting of 24-bits, the Duo will also operate as a 2x2 audio device. In this mode, the Duo is capable of 48kHz or 44.1kHz at either 24- or 16-bits, as set by the music program.

In the “Available Channel Sets” dropdown list, you may also select either”Channels 1&2 In” or “Channels 1&2 Out.” The Duo will perform at 96kHz sampling rate with any single stereo pair enabled, and with the 24-bit Sample Depth also selected. The Duo will not operate at 96kHz when the control panel is set to 16-bits, or when more than one stereo pair is selected for input or output. In the example below, “Channels 1&2 In” is available and “24-bit” Bitwidth is selected, with the Available Sampling Rates section showing 96000 Hz and 88200 Hz.

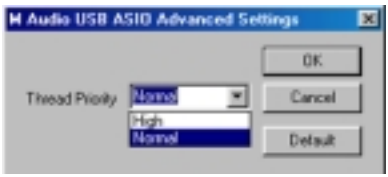


In the M-Audio USB ASIO Driver control panel, to the right of the Bitwidth section, you will see a “Latency” drop-down list that will set the Duo’s buffer size. A lower latency setting represents a smaller buffer size, with the lower setting being desirable when using the ASIO drivers.

How low you can set the latency will depend on several factors, such as your system’s performance and the performance of the music program itself. Try the “High” setting first (which is the default, as shown in the previous screenshot), and then try a lower setting. If your system stutters or performance falters, try the next higher setting until the system performance stabilizes. Once you are satisfied with any of the control panel settings, click “OK” to close the USB Audio Duo Settings page.

Advanced Tab

Some audio applications require more bandwidth in the USB channel for audio than others. Native functions of other USB devices such as movements of a USB mouse may cause clicks in the audio during playback or recording. If this occurs, click on the “Advanced” tab and select “High.”



Note that the default setting of “Normal” will work for most applications. Setting this to “High” should only be done if you are experiencing issues with clicks in audio that are not associated with latency. If the “Default” setting is working, there is no need to adjust it and is to be used only as a means of troubleshooting.

Duo Operation on the Macintosh

The Macintosh Sound Manager

The Macintosh Sound Manager will allow you to select the Duo as the system’s audio input and output device.

Open the Apple menu, then select “Sound” from the Control Panels list. The Duo will operate at 44.1kHz sampling rate at the 16-bit setting in this instance.

At this point in time, most music programs designed for the Mac utilize ASIO drivers. If you decide to switch the Sound Manager to operate the Duo with an ASIO compliant music program, be sure and set it back to “built-in” before launching your program.

NOTE: When switching the Duo drivers from ASIO use to Sound Manager use, after exiting the ASIO program it is necessary to reinitialize the Duo for use with the Apple Sound Manager. To do so, exit your music program, then simply power down the Duo and power it back up.

ASIO Operation on the Macintosh

The Duo driver installation procedure creates a folder on your desktop called " Duo ASIO" that contains Duo ASIO drivers. You will find an ASIO driver in this folder. Check your audio program for ASIO compatibility.

Open your Macintosh HD folder and locate your music program. Within the program's folder you should find an ASIO folder. Drag the Duo ASIO driver to this folder.

Once the ASIO driver is installed, you may open your music program and go to the audio setup page. The Duo ASIO driver will show up in the program's ASIO Driver list, allowing you to select it at this time if it is not already selected by default.

If you are using an ASIO compliant music program, we suggest that you enable and use the Duo's ASIO drivers. ASIO gives you the advantage of being able to monitor your source through the program, similar to monitoring the record inputs of a tape machine, with greatly reduced latency.

ASIO Control Panel and Operating Modes on the Mac

Once the Duo ASIO driver is selected in your music program's audio setup page, you may launch the "USB Audio Duo Settings" control panel. Within the audio setup page you will find a button that allows you to launch the ASIO device's control panel. Clicking this button will launch the Duo ASIO Control Panel and allow you to access the Duo Settings.

The Duo Settings page shows you the M-Audio and the Duo logo. In the bottom left-hand corner you will see a readout of the "Shared Library" version (which are the various ASIO drivers), the USB driver version, and the Firmware currently in use.

Below is a screenshot of the Duo Settings panel with both input and output channel pairs activated. There are two columns, one labeled "Active Channels" and the other labeled "Sample Depth." Settings in these two columns interact with each other, as does the "Maximum Sample Rate" readout. With both input and output channel pairs activated, you will notice that with either 16-bit or the 24-bit setting, the "Maximum Sample Rate" reads out at 48000 Hz.

With both stereo pairs enabled, i.e., Input 1&2 and Output 1&2, the Duo behaves as a "2x2" audio device at 16- or 24-bits, and at sample rates of 48kHz and below (that is, 48kHz or 44.1kHz). These two sampling rate options as well as bit depths will be selectable from within your music program.

Clicking on any one of the active channel boxes and disabling that channel pair (in this example, we have disabled Output 1&2) will free-up some of the USB bandwidth. As a result, the Maximum Sample Rate readout will change to 96000 Hz.

The Duo will perform at 96kHz sampling rate with any one of the stereo pairs enabled, and with either the 16- or 24-bit Sample Depth selected. The Duo will operate at 96kHz when the control panel is set to 16-bits, though this is not a likely choice for 96kHz recording (it's sort of the digital audio equivalent to wearing sneakers with a tuxedo). With one Active Channel enabled and at the 24-bit setting, sample rates of 96k, 88.2k, 48k and 44.1k, as well as bit depths of 24-bit and below, will be selectable from within your music program.

In the Duo Settings control panel, below the Maximum Sample Rate readout, you will see a drop-down list that will set the "Latency" that you will experience while monitoring input through your music program (this is achieved by varying the Duo's audio buffer size). You should be able to find more information about input latency in your music program's manual.

How low you can set the latency will depend on several factors, such as your system's performance and the performance of the music program itself. Try the "High" default setting first (as shown in the previous screenshot). Then try lowering the buffer size if you feel that the latency is too great. If your system stutters or performance falters try the next higher setting until the system performance stabilizes. Once you are satisfied with any of the control panel settings, click "OK" to close the Duo Settings page.

Lastly, you will see a checkbox labeled "Optimize for Slower Systems." If you are running a slower Macintosh computer with native (onboard) USB, checking this box may give you better performance at the lower latency settings. If you are running one of the earlier USB-equipped Macs, experiment with this setting on or off.

Optimizing Your System for USB Audio

Network cards and devices such as print monitors or WinFaxes can cause interference with USB audio, the resulting effect being clicks and pops in your audio performance. The Duo requires a lot of the USB bandwidth, so it's a good idea not to have any active USB devices attached when using the Duo. If you experience clicks and pops in your audio tracks, consider temporarily disabling network cards or modems.

Also, if your system board has an AGP graphics slot and you are using a PCI-based graphics card, purchasing an AGP graphics card and utilizing the dedicated AGP buss may improve performance both in audio and graphics. Additionally, minimizing graphics use in your audio program, such as defeating waveform displays while recording, can improve performance. It is also important that you avoid running applications other than your music program while recording audio, as recording and streaming digital audio is already rather processor intensive.

Here are some other things to consider:

- If you use an IDE hard disk, enable Direct Memory Access, or DMA. Go to the device manager in Windows, open the "Disk Drives" list by clicking on the plus sign next to it. Highlight the IDE drive, then click "Properties". Under Options, check the box that says "DMA."
- A hard drive that is dedicated to audio data is recommended. With the operating system and programs on a separate drive, audio data will be placed as close to the "front" of the drive as possible, optimizing

performance. Drives with low seek times that run at a minimum of 7200 RPM are best.

- You can't be too rich or have too much RAM. It's a good idea to have at least 128MB, while 256MB or more will greatly enhance performance.

Troubleshooting:

Problem: No sound.

Possible Cause1: Drivers have not been installed, or the Duo has not been properly configured in your music software.

Possible Cause2: Audio connections have not been properly made. Check your connections and your cables for continuity.

Problem: I can select the M-Audio USB ASIO driver in my music program, but it gives me an error message.

Possible Cause1: On the PC, make sure that ASIO is selected in the Audio Configuration Manager, located in the systray of your Windows Taskbar. If it is not, the ASIO driver will test and configure properly, but an error message will advise you that you can't use MME and ASIO at the same time.

Possible Cause2: On the Mac, if the Duo ASIO driver is placed in the music program's ASIO folder, you will be able to select it in the audio setup. However, if the Duo is not being recognized by the system, then you will be told that no Duo is attached. Check your USB connections, and make sure that the Duo is powered up.

Problem: I can't hear my system sounds.

Possible Cause1: On the PC, if you are using the ASIO drivers, and ASIO is selected in the Audio Configuration Manager, then you will not be able to hear you system sounds (using the MME drivers) if they are being directed to the Duo. If you have another sound device in your system, you can go to Control Panel | Multimedia and select this other device. Then you will hear system sounds, provided you are monitoring the alternate sound device in some fashion.

Possible Cause2: On the Mac, you must restart once after installing the Duo drivers. Then, go to Apple | Control Panel | Sound, and set the output (and the input, if you like) to "USB Audio." If the Duo is set to "built-in" in the Apple Sound Control Panel, then you will be able to hear the system sounds through the computer's internal speaker(s).

After exiting an ASIO application, the Duo must be reinitialized before it can be used with the Sound Manager. Simply turning the unit off, then turning it back on will do the trick.

Problem: I hear a ticking sound along with my audio.

Possible Cause1: Use the Duo plugged directly into the computer's USB port. On the other USB port, use only the computer keyboard and mouse with no other USB devices.

Possible Cause2: This could be due to an internal device interfering with the USB bus. Refer to the section, "Optimizing Your System for Audio" in this manual.

Before You Call Midiman/M-Audio Technical Support

The technical support team at Midiman/M-Audio wants to get you up and running in an efficient and timely manner. To help us help you, please read the following before calling technical support.

Use Midiman/M-Audio Resources

In addition to your manuals, we also provide you with the following sources of information:
Read Me Files: In your CD ROM, locate the Midiman/M-Audio product you own and open that folder. Find the appropriate Platform (Windows 95, 98, ME, 2000, Mac OS 9, X, etc.) that the folder may contain for your product. The Read Me Files often contain important information regarding updated drivers or driver installation procedures.
Website: Studies show that over 75% of our calls can be avoided, thereby saving you the hold-time and inherent phone bill, by tapping into the resources our website has to offer. The Midiman/M-Audio web page is also available to you on your drivers CD ROM. There you will find FAQs, Tips & Tricks, and How-To Guides to walk you through installing your product as well as configuring it with some of today's most popular software applications. You can also find updated web pages on the world wide web at www.midiman.net or www.midiman.com. Go to SUPPORT and browse through the How-To Guides and FAQs to read up on issues related to product drivers.

Gather Important Information

If you cannot find what you are looking for within the Midiman/M-Audio resources, you can call our technical support line. Please be ready to provide the following basic information.
Product Name: Please know the exact name of the Midiman/M-Audio product you own (make and model— Example: "Midisport 2x2", "Delta Audiophile 2496"). Tell the tech how long you have owned the product. If you start with the frame of mind of providing basic information, your tech call will go smoothly from the get-go.
System Information: The next most important piece of information is what computer platform you are using—i.e. Is this a Macintosh or a PC, and what Operating System (O.S.) are you running with it Windows 98, ME, etc. or Mac OS 9.1, 9.2 etc.? Also tell us what kind of processor you are using (Athlon, G4, Pentium, etc.) and how much RAM you have.
If you are a PC user, be prepared to let us know the following:
1. What kind of chipset does your motherboard have? (Consult your motherboard manual or computer's manual for help with this). 2. Are devices such as Modems,

Soundcards, Ethernet adapters embedded on the motherboard, or connected via USB, ISA, or PCI. How many PCI/ISA slots do you have and are you using any USB hubs? 3. Are you recording to IDE or SCSI hard drives?

These are extremely important pieces of information to know when calling us.

Finally, Mac users using OS X must know what their System Administrator Password is.

Symptoms: Please be ready to describe the symptoms to the best of your abilities (crackle, stuck notes, jitter, etc.) and whether or not they are consistent (Do they happen at the same place at the same time —each time? Etc.). You may also want to note when you started experiencing these problems and whether it was related to any specific incident or not.

After gathering this information, please have your telephone near your computer and/or Midiman/M-Audio product. If you're calling from a cell phone, please prepare plenty of battery power as well as make sure that a cellular signal can be clearly reached where you are calling from. Sit back, try to relax and then dial. Our top-notch technical support team will be ready to help you fix your problems.

Thank you for using Midiman/M-Audio products.

Appendix A - Technical Specifications

Analog Audio

Maximum Input - Mic In:	16 dBV
Headroom:	26 dB
Maximum Gain - Mic. In:	60 dB
Input Impedance (1 kHz) - Mic In:	2.4 kOhms
Input Impedance (1 kHz) - Line In:	10 kOhms
Peak Analog Input Signal (Line In):	+19.0dBu (+4dBu setting), +2.1dBV (-10dBV setting)
Peak Analog Output Signal (Line Out):	+20.0dBu (+4dBu setting), +2.0dBV (-10dBV setting)
Dynamic Range:	
Line In to Line Out:	105dB (A-weighted),
Mic In to Line Out:	107dB (A-weighted)
THD + N (at -10dBFS):	
Line In to Line Out:	less than 0.002%,
Mic In to Line Out:	less than 0.002%
Frequency Response:	22Hz - 22kHz, -0.3,-0.2dB
Input Impedance (Line In):	1M ohms minimum
Line Input Connectors:	1/4" female TS-type, unbalanced
Line Output Connectors:	1/4" female TRS-type, balanced or unbalanced

Digital Audio

Digital Output Format:	S/PDIF coaxial, 0.5V peak-to-peak;
Digital Output Sample Rate:	44.1kHz to 96kHz.
Power Supply:	9V AC 1 Amp; 2.5mm plug.

Limited Lifetime Warranty

MIDIMAN warrants that this product is free of defects in materials and workmanship under normal use so long as the product is: owned by the original purchaser; the original purchaser has proof of purchase from an authorized MIDIMAN dealer; and the purchaser has registered his/her ownership of the product by sending in the completed warranty card.

This warranty explicitly excludes power supplies and included cables which may become defective as a result of normal wear and tear.

In the event that MIDIMAN receives written notice of defects in materials or workmanship from such an original purchaser, MIDIMAN will either replace the product, repair the product, or refund the purchase price at its option. In the event any repair is required, shipment to and from MIDIMAN and a nominal handling charge shall be born by the purchaser. In the event that repair is required, a Return Authorization number must be obtained from MIDIMAN. After this number is obtained, the unit should be shipped back to MIDIMAN in a protective package with a description of the problem and the Return Authorization clearly written on the package.

In the event that MIDIMAN determines that the product requires repair because of user misuse or regular wear, it will assess a fair repair or replacement fee. The customer will have the option to pay this fee and have the unit repaired and returned, or not pay this fee and have the unit returned unrepaired.

The remedy for breach of this limited warranty shall not include any other damages. MIDIMAN will not be liable for consequential, special, indirect, or similar damages or claims including loss of profit or any other commercial damage, even if its agents have been advised of the possibility of such damages, and in no event will MIDIMAN's liability for any damages to the purchaser or any other person exceed the price paid for the product, regardless of any form of the claim. MIDIMAN specifically disclaims all other warranties, expressed or implied. Specifically, MIDIMAN makes no warranty that the product is fit for any particular purpose.

This warranty shall be construed, interpreted, and governed by the laws of the state of California. If any provision of this warranty is found void, invalid or unenforceable, it will not affect the validity of the balance of the warranty, which shall remain valid and enforceable according to its terms. In the event any remedy hereunder is determined to have failed of its essential purpose, all limitations of liability and exclusion of damages set forth herein shall remain in full force and effect.

DUO-010802